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OUROBOROS  
OR THE MECHANICAL  
EXTENSION OF MANKIND

*GARET GARRETT*

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OUROBOROS

## TO-DAY AND TO-MORROW

*For the Contents of this Series see the end of  
the Book*

# OUROBOROS

OR

THE MECHANICAL  
EXTENSION OF MANKIND

BY

GARET GARRETT

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*Ouroboros was a fabulous snake, the encircling serpent, that swallowed its own tail. It represented an infantile thought of the human mind for wish-fulfilment by magical means. Man's heroic business was to conquer the reptile. As he did this he seized the object he most desired. He might even wish himself into solid gold.*



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## CONTENTS

	PAGE
I THE QUEST SINCE ADAM	7
II THE MACHINE AS IF .	23
III THE LAW OF MACHINES	31
IV WHO MIND THEM OR STARVE	42
V THE PARADOX OF SURPLUS	58
VI IN PERIL OF TRADE .	72
VII DIM VISTAS NEW .	84



# OUROBOROS

## I

### THE QUEST SINCE ADAM

ONE story of us is continuous. It is the story of our struggle to recapture the Garden of Eden, meaning by that a state of existence free from the doom of toil.

So long as the character of our economic life was agricultural, as it almost wholly was until a very recent time, the attack was naïve. In the file of prayers, if one is kept, the thickest, dustiest bundle is that of our supplications for plenty—miraculous plenty without worry or price. We were loth to believe that the second arrangement between God and Adam made at the gate of exit :

Cursed is the ground for thy sake ;  
In the sweat of thy face shalt thou eat bread

was forever ; and for a long time afterward local weather conditions were

## THE QUEST SINCE ADAM

wistfully misunderstood, as a chastisement when they were bad and a sign of relenting when they were good. It was forever. Nature's ring was closed, never again to open for any darling fructuary.

That is to say, man's taking from the soil is an arbitrary wage. He may increase the gross of it a little by exerting himself more : the scale he cannot alter. If tilth for the individual has been made easier somewhat and more productive by the use of wheeled implements, power tools and now airplanes to dust the orchard with insecticide, these, you must remember, represent a tremendous increase of effort by mankind at large upon the principle of limited fecundity that governs the earth.

When at length the realistic mind perceived that here was a natural fact upon which prayers, thanksgiving, sacrifice, idolatry, and the pretensions of magic were all alike wasted, the spiritual part of us no doubt had been willing to accept the sentence. Not so the earthy and lusty part. The curse was heavy. There was never a risk man would not take, no kind of heroic exertion he would spare himself, to escape the evil, the boredom, the drudgery of repetitious toil.

## THE QUEST SINCE ADAM

From such puerile motivation came the Age of Discovery, then physical science, purposeful mechanical invention, the industrial era, and all the artificial marvels of the modern world. These effects are historically traceable; and, if it should occur to you to wonder why they are so much more vivid and astonishing in the West than in the East, that is easily explained. The European mind went on with the phantasy of an earthly paradise of plenty and leisure after the Oriental mind in weariness of wisdom had given it up.

Until four hundred years ago the Europeans believed that somewhere in the world was a fabulous land whose inhabitants lived as in dreams, eating and drinking from golden vessels, wearing priceless jewels like common beads, sated with ease and luxury. King, courts, astronomers and navigators believed this. The vulgar fancy was for a place such as Cockaigne of the medieval ballads, where all features of the landscape were good to eat or drink and nobody ever was obliged to work. In quest of this mythical region the pioneer feats of circumnavigation were performed.

What a disparity between the character

## THE QUEST SINCE ADAM

of the motive and the shape of the dead !  
—or is it that men do not know their  
motives ?

The earth was explored. It was found  
to be round and full of labour. This, of  
course, was a terrible disappointment.

The ceaseless mind then turned to  
alchemy with the idea that base metals  
were changeable into gold ; from this  
came chemistry and the study of matter  
and physical phenomena in a new way,  
taking nothing for granted. This was the  
beginning of true Science. As to what  
might come of it practically there was at  
first only the rudest kind of notion. Dimly  
it was understood that exact knowledge  
must somehow increase man's power, give  
him control of the elementary circum-  
stance, enable him perhaps to command  
that which hitherto he had got by hazard.  
When a great body of fact-knowledge had  
been accumulated, men began to see little  
by little how it might be dynamically ap-  
plied. Then the epoch of Mechanical  
Invention.

The idea of machines was not new.  
Long before the beginning of the Chris-  
tian era the ancients had produced many  
wonderful automatic devices ; but mechan-

## THE QUEST SINCE ADAM

ical knowledge with them was a department of magic. The use of machines was to mystify the multitude. Brazen figures were made to move, dragons to hiss, temple doors to open and close, trees to emit musical sounds, and lamps to trim themselves perpetually by means of floats, cogwheels, cylinders, valves, and pistons—all acting on sound principles of pneumatics and hydraulics. Much of this ancient technology was lost or forgotten. The European mind rediscovered it gradually in a spirit of scientific curiosity, with no clear economic intention. And, but for a simple practical idea, one that was very slow to come through, the machine no doubt would still be what it anciently was—an object of superstition, the toy of wonder, an accessory of priestcraft.

And what an obvious idea it was!—merely to exploit the machine's slave value. Merely to see an engine as a beast of burden and the loom as a projection of the hand, both instruments of magnified production, to spare the labour of mankind.

That moment in which the use of mechanical energy came to be so conceived was one of elemental significance. All the chances of human life were altered,

## THE QUEST SINCE ADAM

though not as anyone supposed or as they were meant to be.

The course of internal evolution requires to be imagined. It is slow beyond perception. It may not be a fact ; or, for aught we know, it may be finished in the species. Suddenly man begins to augment himself by an external process. His natural powers become extensible to a degree that makes them original in kind. To his given structure—the weakest among animal structures in proportion to its bulk—he adds an automatic, artificial member, responsive only to his contact, answerable only to his will, uncontrolled by nature, fabulous in its possibilities of strength, variation, and cunning.

His use of it in three generations has changed the design of civilization out of recognition. That change alone which sets our time off abruptly from all time before is the fact of potential plenty. We take this for granted as if it were a natural fact, whereas, instead, all the circumstances have been invented.

We who are born to the view cannot see it. We cannot imagine what it was like to live in a world where famine was a frequent visitation and all things were

## THE QUEST SINCE ADAM

scarce. Yet never until now has the human race known what plenty was. Immemorially the word has signified food.

See, the smell of my son is as the smell of a field the Lord has blessed. God give thee of the dew of the heaven and the fatness of the earth and plenty of wine and corn.

The cornucopia, horn of plenty, never contained a fabricated thing—only the fruits of the earth.

That old meaning of the word has been recently lost. Modernly we speak of 'goods'; we talk of the standard of living, which is understood of course to include proper quantities of food, and to mean, besides food, an endless number of artificial things which people increasingly require for their comfort and well-being.

Mechanical energy does not produce food. Nor has the principle of limited fecundity that governs the earth been suspended. Yet the machine has enormously increased the food supply in two ways: first, agriculture is equipped with power—tools, so that one man now may perform the labour of many; second, transportation has made all the food-producing areas

## THE QUEST SINCE ADAM

of the world accessible, so that grain from the middle of the North American continent and grain from Argentina are mingled unawares in the European loaf.

This use of the machine to distribute food swiftly over the whole world from where there is a surplus to where that surplus is needed has had profound political, economic, and social consequences, beginning with an increase of the human species vastly beyond any number that had at any time previously existed or could ever before have been sustained upon the earth. That is the one most awesome phenomenon of the industrial era. The North American continent has been peopled from European stock. Its present population is equal to that of all Europe in 1800. This drain of emigration notwithstanding, the population of Europe in the same time has trebled.

And still there is plenty.

Where it is not actual, it is potential. Who have not plenty are either too inert or too ignorant to put forth the modern effort. What people may use, enjoy, and consume now is an  $x$  quantity, determined neither by the rhythms of nature nor any

## THE QUEST SINCE ADAM

biological principle, but simply by the free total of their own exertions.

Faster than the race has multiplied the powers of the machine have increased. One of these is the power of transportation, whereby the food product of the whole earth is made uniformly available. The other power is represented by a divisible product of artificial things tending to exceed the sum of effective human desire.

To wishful desire there is no limit whatever ; but there is a point at which the effort necessary to obtain the object—that is, the toil—will be weighed against the desire to possess it, and only when and if the object is deemed worth the effort is desire effective in the economic sense.

From the paradox mentioned—that tendency of the machine's divisible product to overwhelm the sum of effective desire—we get a series of complex phenomena of which there is nowhere yet a complete understanding.

This now is a buyer's world where formerly it was the seller's. Business no longer sits in Asiatic dignity waiting for its customers ; it must up and seek them. The buyer is pursued.

As I write, the strains of a Liszt rhap-

## THE QUEST SINCE ADAM

sody float through my window. They come from a farmer's cottage a little way down the road. Yesterday a motor-truck stopped at his house and unloaded a self-playing piano. I saw it and noticed that it got slightly damaged squeezing through the tiny doorway.

What does this mean? First, it means that the day before yesterday a salesman from the city went through this road selling self-playing pianos for a nominal cash sum down and the balance on monthly instalments. He sold one there, another in the next house but one, and a third further on. How many he sold to the end of the road I do not know.

But what does it mean that the city sends a man through a country road in southern New Jersey to sell pianos in this beguiling manner to people who cannot afford them? Those who bought them I know were all in debt for other things bought on the instalment plan. It means there is a necessity to sell this industrial product. It is the necessity of a factory that has overtaken the normal demand for self-playing pianos and must force the sale of its surplus. It is the necessity of all who work in that factory and live thereby.

## THE QUEST SINCE ADAM

It is the necessity of industry in general, governed as it is by a principle it did not invent.

The principle is that the divisible product of the machine is cheap in proportion to the quantity. Remember that principle. We shall meet it again.

As with player-pianos and radio-sets in my country road, so with all manner of artificial things, with the whole divisible product of the machine, in every road, every street, every market of the world. How to produce enough is no longer any problem at all. How to sell what is increasingly produced—that is the problem. Evidence thereof is the commonest thing we see. It is painted in the landscape. It illuminates the cities at night. It is in our marginal vision when we read. There is no lifting one's eyes to heaven, no casting them down in shame, no seeing whatever without seeing it.

Each day a forest is cut down and consumed for wood-pulp to make the paper on which producers advertize their wares. The use of advertizing is to stimulate in people a sense of wanting. Selling is a high profession to which men are trained in special schools. To exchange goods for

## THE QUEST SINCE ADAM

money over a counter, to higgler with the individual buyer—that is not selling. Clerks and peddlers do that. Selling is to create new ways of wanting, new habits of comfort and luxury, new customs of having. This is done by agitating the mass-imagination with the suggestive power of advertizing. Business reserves its most dazzling rewards for one who can think of a way to make thousands, millions, whole races of people want that thing to-day which they knew not the lack of yesterday.

Why is this so? Because there is never enough wanting.

And why is there never enough wanting? Because the divisible product of the machine tends to increase faster than wanting.

What advertizing cannot accomplish governments may undertake. There are backward, inert, idle races that do not want much. They are content to do with little. It becomes therefore the diplomatic and military business of the powerful industrial governments to change the ways of such races. They must be brought forward, modernized, electrified, taught how to want more. Why? In order that they

## THE QUEST SINCE ADAM

shall be able to consume their quota of the machine's divisible product. Plenty shall be put upon them.

There is no limit to that blessing. Those who have it are anxious to share it, must share it in fact, in order to keep it for themselves, under the principle that the cheapness of things is in proportion to the quantity produced. The more the cheaper ; the fewer the dearer.

Are you beginning to suppose that man has found what he sought ? Since in this extraordinary manner he appears to have provided himself with plenty, shall that dusty bundle of prayers be recalled or sent to the furnace ?

As to his prayers, they were never frank. Perhaps for that reason he should wish he had them back. He prayed for plenty ; what he secretly associated with the thought of plenty was leisure—freedom from toil. And once more he is disappointed, thwarted by his own inventions. Plenty he has achieved. Toil he has not escaped.

The machine that was to have been a labour-saving device becomes an engine of production that must be served. It is as if you could not save labour at all—as if you

## THE QUEST SINCE ADAM

could make it only more productive, thereby achieving an abundance of things with no effect whatever upon the necessity to perform monotonous labour. All this labour-saving machinery we live with notwithstanding, never were people more complaining of their tasks. That might mean only that they were increasingly conscious of an abating evil; but there is no certainty that the abatement even where it is noticeable is permanent. The signs are otherwise.

In all material respects people are better off than ever before. Their bodies are more comfortable, their minds are free from the terror of hunger, they have much more to enjoy and consume and hope for, because their labour is more richly rewarded in things. See the amazing quantity and variety of things such as only the rich could once afford now circulating at the base of the human pyramid. Not necessaries only. Silks, watches, ornaments, shoes like those of queens and ladies, plated ware, upholstered furniture, soft beds, besides things that were formerly non-existent and therefore beyond the reach of kings, sultans and nabobs, such as electric lights, plumbing, motor-cars. In

## THE QUEST SINCE ADAM

the United States a motor-car to every six persons ! And still no sign that the curve of human contentment is rising ; no sign that the curse of toil will ever be got rid of.

Instead of saving labour the machine has multiplied it. True, the hours of industrial labour are fewer than they were, e.g. now eight where they were ten and twelve a day ; but this is merely to compare worse with better where better is, and that is not everywhere. For a proper contrast compare the industrial with the idyllic task. Even eight hours of labour a day continuously performed by the industrial worker represents a much greater sum of annual effort than his ancestor put into the soil. Consider also how the machine, directly or indirectly, has laid new work upon races hitherto naïvely existing in a state of nature.

The riddle is that industrial civilization, having created to its unknown ends a race of mechanical drudges, requires nevertheless a contribution of human toil more intense, more exacting, more irksome than ever. As toil it is more productive—there is more to consume. Life has been expanded. It is safer. Physically it is inconceivably richer. Was that the goal ? What else is gained ?

## THE QUEST SINCE ADAM

You would think that when man had found a way to provide himself with artificial things in unlimited plenty and a way at the same time to spread the food supply evenly over the face of the earth, the gift of universal peace might follow. Never was the peace more frail ; and this, as we shall see—the frailty of the peace—is also a product of the machine.

What force is this by fumbling found that man has put in motion ? Its pulsations he controls ; its consequences so far have controlled him, and modern life has become so involved in a mechanical spiral that we cannot say for certain whether it is that we produce for the sake of consumption or consume for the sake of production.

## II

### THE MACHINE AS IF

EITHER the machine has a meaning to life that we have not yet been able to interpret in a rational manner or it is itself a manifestation of life and therefore mysterious. We have seen it grow. We know it to be the exterior reality of our own ideas. Thus we are very familiar with it, as with our arms and legs, and see it in much the same way—that is to say, imperfectly and in some aspects not at all. Certainly it would look very different if for a moment we could see it from an original point of view with the eye of new wonder.

Fancy yourself a planetary tourist come visiting here, knowing beforehand neither God nor man, unable therefore to distinguish intuitively between their works.

Would you not think the machine that spins silk threads by the ton from cellulose more wonderful than the silkworm

## THE MACHINE AS IF

similarly converting the mulberryleaf in precious quantities, or a steel ship more amazing than a whale? What of the mechanical beast with a colorless fluid in its tail and a flame in its nose that runs sixty miles an hour without weariness? Would it not seem superior in many ways to the horse that goes forty miles in a day and falls down?

Suppose, moreover, that you know the tongue of men and are able to ask them questions. You ask particularly about the automobile, which you have mentally compared with the horse; whereupon they take you to the factories in Detroit to see the automobile in process of becoming, under conditions of mass-production, two or three taking life with a snort every minute. In this factory, they tell you, they make only one hundred a day, very fine ones; but in another they make five hundred, and in another five thousand a day.

You ask them who makes the horse.

They do not know. They teach their children to say God makes it. The horse is a natural thing.

Then the automobile is an unnatural thing?

They say no, smiling a little. Not an

## THE MACHINE AS IF

unnatural thing. The automobile is a mechanical thing because they make it themselves.

You ask them why they say they make it.

At this they are distressed. There has been some slip of understanding in the use of language. They explain it carefully. The horse is born. There is no horse-factory. The automobile is made, as you have seen, in factories.

Still it is not explained. You argue it with them. What is it they do in the factory? They perform certain acts in relation to automobiles. These, of course, are necessary, vital acts. If they were not performed, automobiles could not be. And yet, how does this prove they make automobiles? You ask them.

They ask you to say what else it could prove.

You may say it proves only that they are fathers of automobiles; and, since they seem mystified greatly by this answer, you remind them that in relation to their own children also they perform certain vital acts, essential to beget them and without which children could not be, yet they are

## THE MACHINE AS IF

never heard to say they make children. They say children are born.

This has to be left as it is. Further explanations lead to worse confusion.

You ask them certain other questions. How long have they been on the earth—themselves? How long have they had machines? What did they do before they had machines?

By their replies certain facts are established in your mind, and from these facts you make certain deductions, all clear enough to you but incomprehensible to them.

The facts are as follows: People have been here on the earth a very long time, millions of years they think. Machines they have had for only a very short time, or, as you now see them, for only two generations. Before they had machines nearly everyone tilled the soil. There was no industry save handicraft. In the space of one hundred years these conditions have so remarkably changed that now only half the people are required to till the soil; the other half live by industry. This does not mean what you thought at first; it does not mean that half the fields have been abandoned so that half the people might go

## THE MACHINE AS IF

into industry. You are careful to get this straight, for it is very important. On the contrary, since machines appeared whole new continents of land have been opened to cultivation. This was necessary in order to feed the industrial workers who live in cities, far off from fields, and buy their food, whereas formerly everyone generally speaking produced his own food, even the people of what once were called cities going forth seasonally to till and reap the earth. Actually, the number of people engaged in agriculture has greatly increased ; yet it is only half the population where before it was the whole of it. What does this mean ? It means that since the advent of machines the human race has enormously increased in number ; it has so increased that the half of it which now is agricultural is greater than the whole of it was before. The new, non-agricultural half is the industrial part : it is the part that serves machines.

This fact is so astonishing that you wish to verify it. You ask them what would happen if all the machines in the world should vanish suddenly away. Their answer is that half the people living would perish in a week. And that is what you thought.

## THE MACHINE AS IF

What may you deduce from these facts ?

First, you will be amused that people are so naïve as to think they make machines. Then you may say there are two kinds of people here, agricultural and industrial. The earth makes one kind ; machines make the other. And you will feel as sure of this as if you had proved it to your senses when you have looked at a typical industrial city where people live densely in compacted habitations with no visible errand on earth but to run to and fro tending the machines that hum night and day in the factories. Those tall, cylindrical, erupting forms called smokestacks will appear to you as generative symbols. If they were not there, neither would the people be there. Not only would the people not be there. They would be nowhere. They could never have existed. If the smokestacks disappeared, so would all these people, the industrial part of the population, leaving only the agricultural part—the part belonging to the soil—as it was before.

As a planetary tourist, you may be at least as certain these thoughts are true as men are that they are untrue ; and even if they were true that would make no differ-

## THE MACHINE AS IF

ence really. The problems are practical. We must think of machines as machines act, logically.

One difficulty is that whereas the machine is automatically, unerringly logical, and nothing else, man has only a little logic; he has, besides, emotions, sentiments, instincts. In his unlogical character he has often opposed himself to the machine, meaning to destroy it. At the opening of the Liverpool and Manchester Railway, the first railroad in Great Britain and the first in the world, the anti-machine feeling of British craftsmen was dramatically symbolized by a lone weaver seated at a loom on a high hill. England was the industrial machine's first habitat on earth. There fanatical men led mobs against it.

Frail and clumsy as it was at first, its life was indestructible. And now man would not dare destroy it if he could. His own life is bound up with it. Steadily it has grown more powerful, more productive, more ominous. It has powers of reproduction and variation which, if not inherent, are yet as if governed by an active biological principle. Machines produce machines. Besides those from which

## THE MACHINE AS IF

we get the divisible product of artificial things, there are machines to make machines, and both kinds—(both the machines that make machines and those that transform raw materials into things of use and desire)—obey some law of evolution.

Compare any kind of machine you may happen to think of with what its ancestor was only twenty-five years ago. Its efficiency has doubled, trebled ; its shape has changed ; and, as it is in the animal kingdom so too with machines, suddenly a new species appears, a sport, a freak, with no visible ancestor.

Man's sense of material power within his environment has increased proportionately. It is colossal. Benefits such as formerly he would have thought beyond supernatural agency if he could have imagined them at all he now confers upon himself. More without end presents only technical difficulties. No physical circumstance forbids him. Nevertheless the fact, and only the more strange it is, that for reasons which he names economic or political he seems powerless to inform the augmenting body of machine phenomena with a rational or benign spirit.

### III

#### THE LAW OF MACHINES

No longer do we speak of machines. They are too numerous and too different. We speak of industrial equipment, which means machine-power in general.

As you may know, the industrial equipment of the world is increasing by terrific momentum. The machine is spreading over the face of the earth like an idea new truth. And this is so notwithstanding the fact that the industrial equipment already existing in the world is so great that if for one year it were worked at ideal capacity the product could not be sold for enough to pay the wages of labour, to say nothing of the cost of material, overhead charges, or profit. Markets would be glutted with goods. Producers would be ruined.

It follows that the pressing anxiety of industry is how to regulate and limit production in order not to overwhelm its

## THE LAW OF MACHINES

markets. Its chronic nightmare is over-production, meaning a quantity of divisible products in excess of the immediate sum of effective desire. Hence combines, pools, rings, cartels, committees, and associations of manufacturers, which the courts are powerless to prevent even where they are forbidden by law. These are a vital measure of mutual preservation. Yet they are but protocols of truce. They very soon break down and have to be made all over again.

Control of production, save here and there for a little while, is a myth. It could be managed only in case there was a monopoly of machine power. Once there was. There is no longer, and never will be again. Industrial production, taking it broadly, increases in an uncontrollable manner.

The evidence is notorious, first in the efforts of national industry to increase the sale of goods in its own country, and then in the strife among industrial nations for access to foreign markets.

A steam calliope jamming its way through the crowded street of New York City to advertize a new model of a popular motor-car at a reduced price is a spectacle

## THE LAW OF MACHINES

to bear reflection. It is a symptom of saturation in the home market. When Henry Ford was making only a thousand cars a day, he did not advertize. There was a ready cash-demand for the whole of his product. When his output passed five thousand cars a day, he began to advertize on billboards and to sell on the instalment plan.

As the natural cash-demand for a thing is overtaken, it begins to be pressed for sale on credit. At this point finance steps in. Credit companies with millions of capital are formed expressly for the purpose of lending buyers the money with which to buy. Desire shall be made effective. Selling on credit in this manner has latterly, and suddenly assumed such proportions as to represent in the affair of business a new pattern. Some old-fashioned minds have been debating it as an evil. They attack it on the ground that it betrays the virtue of thrift. But thrift has ceased to be a virtue. To consume—to consume more and more progressively—to be able to say in the evening “I have consumed more to-day than I consumed yesterday”, this now is a duty the individual owes to industrial society.

## THE LAW OF MACHINES

For see what would happen if people all over the world should return of a sudden to the former ways of thrift—to the habit of doing without? There would be depression in industry. Machines would stop. Millions who tend them would be disemployed. Nothing would be safe, not even your own money, for there would be panic on the exchange and trouble at the bank.

One is not speaking of the United States alone. The multiplication of things is greater here than anywhere else because we make machines faster and work them harder ; but you will find the same necessity acting also in France, the very cradle of thrift, where now cheap motors are sold on credit : anyone who will buy may borrow the money to buy with. Why is this in France ? To stimulate the motor habit ? To serve a private profit-motive ? The habit will follow ; the profit may. But there is another reason, touching foreign trade, which we are coming to elucidate.

In order to sell abroad, an industrial nation must be able to produce cheaply. To produce cheaply, it must produce in large quantities by a multiple method

## THE LAW OF MACHINES

called mass-production. And you can safely manage this mass-production only provided you have a fairly large and constant base of domestic demand. So the sale of French motor cars in France, though it be on credit, must be large enough to support the method of mass-production, for otherwise France would be unable to meet the competition of Ford, who now exports motor-cars to Europe—even builds them there. Then the British manufacturers, to meet the competition of both France and Ford, also undertake against their genius to produce motor-cars by the quantity method, and, having achieved the method, their next dilemma is what to do with the product. They advertize at home to create a popular motor-car habit and at the same time press their cars for sale in foreign markets, even in France and Germany, as these countries press theirs for sale in Great Britain.

Competition among industrial nations to exploit one another's internal markets is but one profile of all that dangerous activity taking place in the name of foreign trade. The industrial powers holding their feet in China's doorway and France fighting

## THE LAW OF MACHINES

the native in Morocco are other aspects of the same thing. China so long as possible shall be an open market for the surplus product of western machines ; there shall be more wanting in Morocco.

The industrial equipment of the world meanwhile goes on increasing, though it is already so great that its capacity cannot be fully utilized. In the United States alone there is probably enough surplus machine-capacity to satisfy the whole demand of Great Britain's foreign customers for staple merchandise, such as textiles, iron and steel manufacturers, rubber tires, motor-cars, electrical apparatus, machinery, glass, garments, shoes, cutlery, and so on. Great Britain not only has a surplus of machine-power ; she has besides an excess of man-power represented by say one and one-quarter millions unemployed. She could easily take on the entire foreign trade of France ; but in France also there is a surplus of machine-power. Both Great Britain and France dread the competition of Germany, whose production of goods with her existing equipment could be increased, under incentive, nobody knows how much.

The exterior facts do not make sense.

## THE LAW OF MACHINES

They represent industry to be witless, in that, while dreading surplus as the evil that devoureth profit, it is at the same time bent to push supply to a point beyond saturation. Industry does not do this. Necessity does it. There is an interior fact. The tendency of the divisible product of machines to exceed the sum of effective desire is the last thing that industry wishes for. It is owing to a principle hitherto mentioned, namely, the principle that the cheapness of things is in proportion to the quantity produced. Which now is to be explained.

It is the economic function of the machine to cheapen production. There is otherwise no point to it. But, if we say things are more cheaply made by machine than by hand, we speak very loosely. What we mean is that a quantity of things is more cheaply made by machine than by hand.

For example, the cost of a single yard of cloth produced by machine is hundreds of times greater than the cost of a single yard of it produced by hand. Obviously, the power-loom is a very costly piece of machinery to build, and so is the engine that drives it. If you produced

## THE LAW OF MACHINES

on a power-loom only the amount of cloth a weaver could make by hand, nobody could afford to buy it. But when you produce on the power-loom a quantity of cloth one hundred times greater than a weaver can make by hand, then, of course it is much cheaper. And the more you produce the cheaper it is. So with anything. The greater the quantity, the lower the cost. Hence the terms quantity, or mass-production, meaning, first, to standardize the product, as to make it all black, all one texture, all one width or shape, and then to bring a chain of machine-power continuously to bear upon its multiple production.

Observe the working of this principle. Take watches. At one time they were made by hand, slowly, laboriously, instances being not uncommon of a craftsman spending half his lifetime to make a very fine one. Under these conditions watches are rare and costly. Only the very rich can buy them. Suddenly they began to be made by machines. A very good watch can be made for fifty dollars. There are a million people who want watches at that price. This is an original demand, a kind of vacuum, represented by

## THE LAW OF MACHINES

a million people who have never had watches and now for the first time may possess them. Watches cannot be made fast enough to meet this want. The industry, for that reason, expands very fast. Then all at once the demand is satisfied. The million have watches. The vacuum has been filled. Hereafter the demand will tend to be static: it will increase slowly as the population increases or as people in general grow richer, little by little. The watch-making industry, therefore, is depressed. It has to limit production. Now comes someone with the idea that by carrying the machine method further a watch can be made for ten dollars. There are twenty million people who can afford to buy watches at that price. The ten-dollar watch appears. The demand again is like a vacuum, twenty times greater than the first. For a while ten-dollar watches cannot be made fast enough. The makers of fifty-dollar watches throw away their old machines, instal new ones, increase their production, reduce their costs, and not only make what was a fifty dollar watch for twenty-five but contribute also, in a competitive manner, to the supply of ten-dollar watches. Suddenly

## THE LAW OF MACHINES

what happened before happens again. The twenty million have watches. The vacuum is filled. Then someone says : " But there are one hundred million who would buy watches at two dollars ". So the process is repeated, still lower in the pyramid. The two-dollar watch is not a fine watch, but it will keep time ; and as you would know, with the improvement that has taken place in machine practice the cost of making any kind of watch, even the finest, has been greatly reduced. A watch ceases to be a luxury or a token of caste. It is a necessary part of man's personal equipment, all the way down to the base of the pyramid.

There you have the cycle. The use of the machine is to cheapen the cost of production. The sign is quantity. When the supply at a given price has overtaken the effective demand you have either to idle your machinery, in which case your cost of production will rise, or open a wider demand at a lower price. To lower the price and keep a profit you have to cheapen the cost of production still more. This you can do only by increasing the quantity, which again overtakes the demand, creating again the same necessity to cheapen the cost by increasing the quantity in order to

## THE LAW OF MACHINES

be able to make a lower price for greater demand. Thus supply pursues demand, downward through the social structure.

There is at last a base to the pyramid—its very widest point. When that is reached—what? Well, then you need bazaars in a foreign sun, heathen races of your own to train up in the way of wanting the products of your machines, new worlds of demand. You turn to foreign trade. And if you are an aggressive country that has come late to this business, as Germany was, and find that most of the promising heathen races are already adopted and that all the best bazaar-sites are taken, you may easily work yourself into a panic of fear and become a menace to the peace.

## IV

### WHO MIND THEM OR STARVE

WHAT is it you will fear? That you will be unable to sell away the surplus product of your machines? That industry will be unable to make a profit?

No. The fear is that you will starve. Your machines have called into existence millions of people who otherwise would not have been born—at least, not there in that manner. These millions who mind machines are gathered in cities. They produce no food. They produce with their machines artificial things that are exchanged for food. It is usually the case, too, that they have to buy the raw materials on which their machines act, as Great Britain buys raw cotton from the United States and Egypt, and wool from Australia, to feed her great textile industries; having manufactured this material, she sends it forth again as cloth, to be exchanged for wheat in Canada or beef in South America.

## WHO MIND THEM OR STARVE

As you begin with machines your population divides. It becomes part rural and part industrial, and so long as the rural part of it can feed the industrial part there is no trouble. But a time soon comes when the need of the industrial workers for sustenance is greater than the native production of food. This time inevitably comes because the machines call up people so rapidly. Then you have to look abroad for food. That means you have to go into other countries — peasant-countries — where there is a surplus of meat and grain, and exchange there your manufactured goods for food. And you begin to think and speak of your economic necessity.

There is no such necessity really. To assert it is to say a preposterous thing, namely, that when your industrial population has increased beyond the native food-supply, to a point at which you are out of balance, you are obliged to import food so that your industrial population may continue to increase and your cities to grow and your necessity to become greater and greater in an endless spiral.

It cannot be endless. One of two things will determine the sequel. Either presently the resources of those peasant-

## WHO MIND THEM OR STARVE

nations that produce a surplus of food will be exhausted or they will in time think to become industrial nations, too, and eat their own surplus. There is no lucid reason why a population should not disperse as it begins to exceed the native food-supply—that is to say, migrate to the sources of food.

In this new political dogma of an absolute economic necessity to import food and raw materials in exchange for manufactures the ancient myth-wish reappears. The machine does not abolish the curse of toil. It was not the escape men sought. But it does create a preferred task.

Traditionally, the peasant-task has been despised: it bore the curse direct. And, when the machine made it possible for many to embrace instead what was deemed the lesser affliction of industrial labour gregariously performed in cities, the impulse thereto was headlong.

Hence the rise of that angular phenomenon called the industrial nation—a nation able to buy its food, therefore delivered from the fate of peasantry and for that reason entitled to consider itself of higher caste than agricultural nations.

Hence the tumescent city as one of the

## WHO MIND THEM OR STARVE

most alarming appearances of our time.

Hence, also, that idea of economic necessity, which, getting control of the political mind of Europe, inevitably involved the world in a machine-war. What made that war so terrifying, so destructive, so extensive, was the power of the machine—an inconceivable power except as it disclosed itself from day to day. No one beholding the event from a firmamental point of view could have supposed it was a war between races of men. Man in contrast with the machines he served was pitifully insignificant.

In Germany the task of bending the country's industrial equipment to the uses of war was assigned to a man who possessed one of the very brilliant Jewish minds in the world. In him were combined the three high characteristics of his race, which are loyalty, intellectual realism, and dreaming imagination. His practical job was more complex than that of the Chief of Staff. Yet his mind was not wholly occupied with this care. His critical faculties and his imagination were always free.

Reflecting on the economic meaning of the war, he was led to examine the essential character of international trade, and so

perceived clearly how wasteful, preposterous, and dangerous a great deal of it was—Germany pressing the surplus product of her machines for sale in Great Britain, the British doing likewise in Germany, both competing at home and abroad with the industrial surplus of the United States, ships passing on the seas with cargoes of similar goods endlessly duplicated, and all the machine-craft nations seeking peasant-nations to be exploited for food in exchange for manufactures. It was true in this way the world had been growing richer in things, and yet the cost was frightful. The resort to force was a confession that international trade was bankrupt in reason and understanding.

He was competent to reach a conclusion standing himself at the head of one of Europe's great industries. And he made a dream. It was that, when the war had come to an end and people were themselves again, they would see the vital importance to civilization of dividing among them the work of the world agreeably to their special aptitudes and the facts of environment—those to produce a surplus of whatever it was they had a genius for making and the materials ready; these

## WHO MIND THEM OR STARVE

others another kind of thing in which their skill and situation gave them an advantage ; and so on through the whole series of natural and artificial things with which human wants are satisfied. Thus duplication and strife would be eliminated. Not only would there be enough of everything : from the elimination of senseless waste in private and public war there would be a saving of power and capital sufficient to water all the deserts of the earth and recreate man's vistas here.

As a dream, it was most alluring. As a plan it was worthless, for it contained two fatal assumptions, namely, that you could always find a Solomon to administer it and that people would submit to the benevolent tyranny of his wisdom. He himself was destined by his end to illustrate how people really behave. Shortly after the close of the war he was murdered in the name of fanatic nationalism.

It was a sign.

The war released a flood of repressed passions in nationalism. Great and small groups of submerged people asserted rights of self-determination and clothed themselves with frontiers and nationhood. Nearly all of these, together also with old

## WHO MIND THEM OR STARVE

countries whose character until then had been agricultural, were concurrently seized with the thought of economic independence—that is to say, with the thought of having machines and industries of their own, for they had seen a new thing. Industrial nations and none other were powerful in the world. Nations without machines were helpless, subject, in fact, to those that had them.

Enormously stimulated in its function of reproduction by the onset of this human idea, the machine broke bounds. No one now has any control of it.

Only a few years ago Great Britain alone controlled it. She had a monopoly of its power and use by right of having been the first to develop it, and she was for a while the only nation having a large surplus of manufactures to sell in foreign countries. Then came Germany, France, and Belgium. Of these Germany was Great Britain's most aggressive rival, making nearly all of the same things and most of them cheaper. After 1870 the United States developed industry very fast but for twenty years more her exports were principally agricultural because she herself consumed the entire product of her

## WHO MIND THEM OR STARVE

machines, besides importing manufactured goods from Europe in exchange for meat and grain and raw cotton. It was not until about 1890 that American machine-products began to invade the markets of the world in a large way. And at about the same time Japan appeared as an industrial nation, having in a few years equipped herself with Western machines and trained her imitative hand to mind them.

Such, roughly, was the economic state of the world at the outbreak of the War. The powerfully industrialized nations were four in Europe, counting little Belgium ; one in the West ; and one in the East—six altogether, representing hardly more than one-fifth of the world's total population.

If we regard only the countries where the industrial population had so outrun the native food-supply that the sale of manufactures in foreign lands to pay for food had either become, or was believed to be, a vital transaction, then we count out the United States. This country is still self-nourished. That leaves only five, and the competition among these five for markets, for colonies, and heathen tribes to be instructed in wanting, for private pathways by land and sea to the sources of food, for

## WHO MIND THEM OR STARVE

access to the raw materials required by their machines, was already desperate and dangerous. Between two of them it was deadly.

Even then it was so. Since then the machine has multiplied tremendously where its habitat was and has gone migrating, besides, all over the earth.

In those six countries that were already intensively industrialized what appears? Their machine equipment has greatly increased. During the War it increased for obvious reasons. God was on the side of the most machines. Since the War it has continued to increase for other reasons. One reason was peculiar to Germany. There the building of furnaces, factories, and machine-works by a dynastic method, as the pyramids were built, without credit or gold, simply by command of the industrialists over labour and material, was a way of baffling the Allied creditors. Another reason was peculiar to France. Restoring the industries of the devastated regions meant building them a second time, since they had been already once reproduced elsewhere in France during the War. But the reason over all lay in that fixed idea of economic necessity, not changed in

## WHO MIND THEM OR STARVE

the least by anything that had happened, only now more desperate than ever, owing both to the intensified competition of the older countries among themselves and to the spread of the machine into other countries.

How the competition among themselves has been intensified may be illustrated in the case of textiles as between Great Britain and France. Before the War both imported raw cotton and exported fabrications of cotton; but, whereas Great Britain exported principally the cotton cloth of universal commerce, France exported special products representing her genius for style and artistry. Now, however, having made large additions to her general textile equipment, France feels obliged to compete directly with Great Britain in cotton-cloth of common commerce. To do this she must extend her foreign trade parallel to Great Britain's and divide the markets hitherto dominated by the British. As with cotton-cloth, so with other manufactures, particularly those of iron and steel, wherein France proposes to compete and is equipped to compete with both Germany and Great Britain as never before. Each step she

## WHO MIND THEM OR STARVE

takes in this direction augments her economic necessity, for now almost the last thing you would expect to see in France is taking place. The native population as a whole is static, but its character is changing. The industrial part of it is growing; the agricultural part is waning. People are deserting the fields to embrace industrial life—to mind machines. In every city there is a housing problem; public credit is employed to build small dwellings for the wage-earners; yet in the country, two hours from Paris, you will see houses empty and going to ruin, whole rural villages in the way to be abandoned, vineyards perishing for want of care, fields going to grass instead of grain. Their industrial power is rising; their agricultural power is falling. Before the War they were, or might have been, self-nourishing on their own soil like the people of the United States. That precious security they cast away. In place of it they take on the anxieties of empire. They must impose upon Morocco the blessings of European civilization in order to have an outlet there for the surplus of their machines.

Dramatic are the migrations of the machine and not unlike the migrations of

## WHO MIND THEM OR STARVE

natural species, men and beasts, in search of food. The machine seeks either cheaper raw material or people to mind its processes.

There is Italy, with a population greater than that of France, growing half-a-million a year. It is the most fecund race in Europe. Suddenly the Italians wake up and are resolved upon an industrial career. Before the War this thought was dim among them. In the crisis it took shape. Since the War it has become an enthusiasm, and now smoke-towers are rising very fast. Definitely they have turned their minds from agriculture to industry, not merely in order that they may become self-supplied with manufactures instead of buying them from other countries with lemons and olive oil, but in order to grow rich and powerful in foreign trade. They propose hereafter and progressively to exchange machine-wares for food. Italy will be a formidable rival for Great Britain, Germany, France, and Belgium, who are already beginning to feel it.

Poland perceives her destiny to be industrial : she has already a large surplus of manufactured goods to sell. Likewise

## WHO MIND THEM OR STARVE

Czechoslovakia. These are instances of new countries. Spain and Greece are importing machinery, and Spain is so anxious to develop industry that she considers paying a bounty out of the public treasury on exports of textiles. India, whose historic economic function had been to send raw cotton to Great Britain and buy cotton cloth from Manchester, now consumes half her own raw cotton in her native mills ; she not only satisfies three-quarters of her own want for cotton cloth but is beginning actually to export that commodity, even to the United States. This will seem very wasteful, indeed, when you pause to set it against the historical background of the United States. For a long time we exported raw cotton and imported cotton cloth. That was to have been the pattern of our economic life as a British colony ; we were to produce only raw materials, ship them to Great Britain and buy from her the surplus of her machines. We were forbidden, in fact, to weave cloth for sale or to have iron mills. Now we are an industrial nation ; we consume more and more of our own raw cotton and export enormous quantities of cotton cloth. Ultimately we shall have no raw cotton at

## WHO MIND THEM OR STARVE

all to sell ; our mills will require the whole of our annual crop ; we shall have nothing but cotton cloth to sell. To whom shall we sell it ? Not to the Indians ; they wish to make their own. Probably not to the Egyptians. The Japanese manufacturers of cotton goods have recently invaded the Egyptian market that was formerly Great Britain's own, and are underselling the British there. You would think China would be Japan's natural outlet for cotton goods. So it is. The difficulty is that Japan must be looking further because China is beginning to supply herself.

The Chinese instance is poignant. A few years ago—until the War, in fact—China exported food and raw materials and imported manufactured goods—nothing else to speak of either way. This was as the Western industrial nations wished it to be. So anxious were they to have it so that they bound China by treaty not to put tariff barriers against the goods they wished to sell in the Chinese markets, except by mutual consent—that is to say, with their consent.

The War suspended this thralldom. The Chinese imported machines and began to make their own things, especially cloth.

## WHO MIND THEM OR STARVE

Power-looms appeared as by magic. And after the War, they continued to appear. During three years after the War the number trebled, and in 1922, the table of Chinese imports and exports presented a strange face. Among her imports were machines and machine-parts; also semi-manufactured goods to be finished in Chinese factories. And one-fifth of her total exports consisted of manufactured goods. China an exporter of machine products!

And so up and down the earth. In Brazil, where there was hardly any visible production of artificial things before 1914, the whole outlook has changed. That country is now able from her own machines to meet the whole of her want for matches, textiles, footgear, wallpaper, phonograph-discs, hardware, hats, and playing cards, and will soon be self-supplied with practically everything she needs.

The Colonial System that was to have answered forever Great Britain's need for raw materials and food in exchange for machine-products will not hold in that character. In India the revolt is political; elsewhere it is peaceably economic. Canada is already powerfully machined; she is

## WHO MIND THEM OR STARVE

exporting motor-cars. Australia, going in the same direction, is beginning to export shoes. The Union of South Africa takes steps to subsidize local industry. Ireland no sooner gains control of her economic life than she puts a tariff-wall around herself to limit the sale of foreign goods, meaning British goods as well, thinking thereby to foster infant industries.

Well, everyone now is doing that. The old industrial countries, too, are protecting themselves against one another's goods, the last to come to it being Great Britain herself. For more than half-a-century she was the protagonist of free trade, abhorring tariffs, because she was paramount in machine-craft and could beat her rivals both in their own markets and in her own. That advantage having departed from her, she is driven to tariff-protection : she puts up barriers against other people's goods if they are too cheap, because they are too cheap, and calls it Safeguarding Home Industries.

## V

### THE PARADOX OF SURPLUS

WHAT does it mean? Can there be too many desirable and useful things? Can things be too cheap? You would say No. Surely, so long as any human want remains unsatisfied, things cannot be either too plentiful or too cheap? But there is another dimension.

Everything that is not still or dead must exist in a state of rhythmic tension. It is true of the plant, it is true of the animal, it is true of each race of plants and each race of animals, it is true of the kingdom of plants against the kingdom of animals. It is true of people, as individuals, as races, as a species. And it is true, also, of the machine.

In the living organism growth of tissue at a normal rate consonant with the rhythm is vital. A wild growth of that same tissue will be fatal. In the aggregate of life there is equilibrium among millions

## THE PARADOX OF SURPLUS

of different forms, each form striving but never succeeding and is possessing every other form and taking the world. The oyster, if unhindered, would displace every other living thing on the earth in maybe ten generations, and then, of course, perish for want of space in which to contain itself. What hinders the oyster and at the same time preserves it is that principle of tension in nature, without which it would be impossible for innumerable forms and varieties of life, the relations of which to one another are reciprocal, neutral, hostile, anonymous, to exist together all in one great taut pattern.

Now regard the third kingdom, artificial, implanted with mechanical beasts, that contains civilization. Life in this environment is economic. Its characteristic behaviour is a progressive differentiation of labour. Tasks are divided and subdivided until, at length, there are countless separate groups of people, each one performing a singular function to which it is trained and tending to become unable to perform any other. The subdivisions are beyond enumeration. They multiply so fast that the book of the census cannot keep up with them.

## THE PARODOX OF SURPLUS

The shoe-industry, for example, does not consist in shoemakers. You might search it in vain for a shoemaker—that is, one who should know how to raise a pair of shoes from flat leather. In the shoe factory the material passes through a train of machines. Each machine is minded by an operative who performs one little specialized part of the work in endless repetition. The product is shoes by thousands of gross.

But who determines what kinds of shoe and how many shoes shall be made? What becomes of them when they are made? Who knows they can be sold? What if they are not saleable?

If you address these questions to one of the operatives minding a machine you will find him dumb. He knows only his own function.

It is very complicated. There are two industries here. One is the shoe-industry; the other is the shoe-machine industry. One could not exist without the other, yet they are separate and very unlike. The shoe-industry itself, that has dispensed with shoemakers, will have a finance department, an economic department, a buying department, a department of

## THE PARADOX OF SURPLUS

production science, a style and designing department, a chemical department, a department of distribution, a sales department, an advertizing department, and others we do not think of. It is all about shoes. These are all shoe people. They agglomerate in shoe towns. They think shoes. The world is a foot. The more it can be shod the better. They live by shoes.

But to do this they must be able to exchange shoes for the things they want. Shoes, therefore, must have a relation of value to every other thing in the economic world. It follows that, in order to have this exchange-value, shoes must have also a relation of quantity to all other things. If for any reason the production of shoes becomes suddenly abnormal that exchange-value is lost. It is like one kind of tissue growing wild in the organism. Shoes are necessary; but an excessive quantity cannot be absorbed by the economic body. There will be in that case a morbid pathology in the shoe-industry, unemployment in the shoe town, despair among the shoe people, many of whom have never learned to do anything else. Left to themselves, without shoes to make, they might even starve.

## THE PARADOX OF SURPLUS

It may be in the same way a soap town, a textile town, a garment town, an iron town, a motor town like Detroit, a rubber-tire town like Akron, a furniture town like Grand Rapids. It may be all of these—that is to say, industry as a whole, increasing its output at an abnormal rate. As you project the thought you begin to see, first, the vital importance of rhythm, equilibrium, tension, in the realm of industry, and then the inverse meaning of a sudden competitive increase in the machine-power of the world.

Ask the Italians what it means. They are an old people coming to it with a fresh mind. The conversation that follows took place in February, 1925. Talking are, on one side, the Italian Minister of Finance, and on the other, a visiting journalist :

“ The industrial idea is new in Italy. It is since the War. You had a clean slate. You could have done anything you had the imagination to do. First you might have made a scientific survey of Italy's latent genius and resources, and then you might have thought of producing goods that should be uniquely Italian and therefore non-competitive. But what have you done? You have gone in for the great

## THE PARADOX OF SURPLUS

staples of world commerce, such as cotton and woollen textiles, artificial silk, and motor-cars. Don't you see that in doing this you take on the competition of Great Britain, Germany, France, Belgium, the United States? "

" Yes, we see that."

" Those countries have the field and the experience and better access than Italy to sources of raw material."

" That we know, also."

" Then how can you hope successfully to compete with them? What have you that they have not? What advantage against theirs? "

" One you haven't thought of."

" What is it? "

" A man can live on less in Italy than anywhere else. We don't know why that is. It may be the way the sun shines on him. But it is a fact. That is our advantage. With that we shall succeed."

" Do you realize what that means? You are saying that Italy proposes to found an industrial career on the lowest terms of human existence. Your people will not accept it."

" But they will."

" How do you know they will? "

## THE PARADOX OF SURPLUS

“ Because they will do anything sooner than starve.”

What a finish for the morning hope of the machine-age!—if it were. Monotonous tending of the machine on the lowest standard of living ; alternative, starvation.

Suppose it were true. Suppose the Italian people did accept the terms and acquired the knack and skill. Then Italian manufactures, being cheaper than any other, would sweep the markets of the world. The older industrial nations—Great Britain, Germany, France, the United States, *et al.*—could protect their domestic markets by tariff-barriers, but they would find themselves losing their foreign markets to the Italians. For such industrial countries as are obliged to exchange a machine-surplus abroad for food the loss of foreign markets would be fatal. They would have to meet the Italian competition. They would have to say, as the Italians now are saying : “ It is that or starve.” They would have to let down the standard of living to meet Italy’s wage-cost. This would oblige Italy to make her standard lower still, and thus, in a cycle, until all of them were sunk in misery.

And this is by no means an impossible

## THE PARADOX OF SURPLUS

progression of events. It has once taken place on a lesser scale. Beginning about 1870, there was a sudden and uncontrollable increase in the output of industry<sup>4</sup> from two principal causes. One was the rapid rise of competitive industry in Germany and the United States ; the other—much more potent—was the discovery of a new and cheaper way of making steel. This one discovery transformed the aspect of industry by increasing its potential power as much, perhaps, as one-hundred fold. Until then people spoke of the iron age ; after that it was the steel age. For a quarter of a century prices fell continuously, while solemn economic bodies sat pondering the phenomenon. In that time all the capital employed in industry was lost at least once, probably twice or three times. The producer's only hope was to improve his machines and increase production, for as he did that his cost per unit fell and for a little while he could undersell his competitor. In methods of production and in the efficiency of machines there was necessarily amazing progress ; nevertheless, when all other means of reducing costs had failed, it had to be taken out of labour. In the United States it was not so

## THE PARADOX OF SURPLUS

bad because here the domestic demand for manufactures was unlimited, and a tariff-wall protected industry from foreign competition. In Germany it was very bad.

Germany then was where Italy now is. Her advantage was that the German people would work harder and longer for less money than the British. The competition was between these two. The British Government, disturbed by her new rival's success in foreign trade, made a study of labour conditions in Germany. It found Sunday labour very prevalent in the factories. "Only the hours of divine service are excluded", said a report from Saxony.

Commenting, *The* (London) *Economist* said: "The question of Sunday labour is one of considerable interest for England, for it is unquestionable that among the causes of Germany's ability to compete with England as a mercantile and industrial country the fact that here more hours are worked for less money is not the least important. The prohibition of Sunday labour would, of course, mean increased cost of production, and every increase in the cost of production will render it more difficult for Germany to

## THE PARADOX OF SURPLUS

outrival older manufacturing countries in the markets of the world.”

What might have happened does not detain us. What did happen was very fortunate.

First, the food-supply from free virgin land in North and South America increased at the same time in a prodigious manner, so that, notwithstanding the wild energy of the machine, the equilibrium between agriculture and industry was fairly well maintained.

Second, there was still room in the world for colonial development on a vast scale. This occurred, and the outlets thereby created for the surplus product of machines were most timely.

Third—and this is very important—finance, to save itself from deluge, got control of industry. It was unable to buy industry out. All the banks in the world had not money enough to do that. This apparently insuperable difficulty it solved in a simple manner. It formed industry by groups into great joint-stock corporations and sold the stock to the public. And, although generally finance did not keep control in a literal sense, it did so centre it as to make the management

## THE PARADOX OF SURPLUS

responsive thereafter to financial counsel. The classic instance in the United States was the formation of the Steel Trust, which was in very earnest a measure of desperation. The steel-making machine had become a demon whose pastime was panic. By this feat of finance, which occurred in all industrial countries, a new rhythm was established. It was most imperfect: absolute control of production was impossible. But panics from overproduction were thereafter episodic, not continuous, and this was a great improvement.

And now a second time the machine has got away. But how much more powerful it is and widely planted than before. The industrial capacity of the United States alone is greater than that of all Europe twenty-five years ago. There are no more such virgin continents as North and South America to be exploited for food; and, besides, countries that were then content to play an agricultural part, exchanging meat and grain and raw materials for machine-made wares, now are resolved to have industries of their own—nay! more, to have an industrial surplus for sale abroad, engaging in that game themselves. Colonies are no longer docile.

## THE PARADOX OF SURPLUS

And as to finance, there is little probability that it will be able again to lay its hand upon the throttle. There are several reasons why.

The significance of industry has changed. Formerly it was a private affair in which the State was but dimly concerned, and so concerned only in a social sense, whereas now the idea of industry is basically political. It associates with thoughts of security independence in all circumstances, national welfare, power, and grandeur. A factory is like a ship to be privately enjoyed in time of peace subject to mobilization for war. The War did that. Great Britain now subsidizes so-called key-industries as before she subsidized ships under the eye of the Admiralty if they were so built as to be easily converted into cruisers. All this is beyond the control of finance.

For another reason, there are signs that industry in the future is more likely to command finance than finance is to dominate industry.

By finance it shall be understood that we mean organized influence—in short, banking. Its occult authority has been

## THE PARADOX OF SURPLUS

seriously impaired. The high day of its priestcraft is gone.

Formerly it was consulted in war. You could not manage a war without a gold-chest : it was the banker who said whether that could be filled or not. Now one of the first steps you take in case of war is to suspend the bank, declare a moratorium, and print paper money to pass from hand to hand.

When the World-War started it was the opinion of finance that it could not last above ninety days : it could not be financed beyond that limit. It lasted four years and did not stop then for want of money.

After the War international finance was morally powerless to prevent the colossal mark swindle, Germany printing and selling all over the earth billions of paper marks that were to be flatly repudiated. Nor was it able to visit the slightest penalty upon the authors of this financial enormity, for immediately afterwards it was obliged, on political grounds, to float a large gold loan for Germany and thereby restore her to solvency and credit. In Germany finance was unable to prevent the industrial dynasts from appropriating

## THE PARODOX OF SURPLUS

to themselves all the middle-class wealth that was invested in bonds, mortgages, annuities, and savings banks : they simply borrowed it and then paid it back in worthless paper money.

It is very significant this humiliation of finance. In situations where the political will is dominant and in those where economic forces act alone the omens are the same. Henry Ford is the extraordinary instance of an industrialist who proceeds without benefit of finance. He creates his capital as he goes along ; what he does not create he commands. He does not borrow.

## VI

### IN PERIL OF TRADE

So now what will happen? From the excessive power already existing to produce industrial commodities, from the continued increase of that power nevertheless for political and national reasons, from the raising of trade-barriers by one nation against another because every one fears the effect upon its own industries of receiving cheap goods from another, from this running of people out of the fields to tend more machines, from the amazing growth of urban tissue in the economic body—from all of this what follows?

The Italians suggest a bitter competition in terms of living, those to survive who will accept most patiently and at the lowest wage the drudgery of minding machines. That might go rather far; ultimately it comes to absurdity. To whom at last should they sell their goods? Not to the impoverished workers of other industrial

## IN PERIL OF TRADE

countries, defeated in the struggle. To whom else? To the agricultural countries? But these, for the reasons we have seen, are tending as such to disappear. They are buying machines. Italy brings nothing to the solution. She is merely coming tardily to do what others have done to excess.

A brilliant Belgian economist suggests that only the most efficient equipment will survive, and only enough of that to satisfy the natural demand for goods. All the rest must be abandoned because there will be no profit in working it. Well, it remains to be seen if people will abandon their machines without a struggle, purely for rational reasons. Much more is it likely that the higher cost of working the less efficient equipment will be compensated by a lower wage-rate, unemployment being the workers' alternative. Moreover, if all the inefficient and unnecessary machines were scrapped that would mean only postponement of the sequel. The competition would begin all over again.

There are those who suggest that we are facing toward the mercantile system of the Middle Ages, when it was the custom for each nation jealously to protect its

## IN PERIL OF TRADE

home-market from the competitive handicrafts of other nations, and to prohibit or punitively tax the exportation of raw material to rival countries. So we are. To say it is merely to indicate the rock upon which, if nothing happens, the ship of trade is bound to wreck herself.

A growing light on the actions of trade as it is organized by the industrial powers now impels nations hitherto agricultural to found industries of their own. As producers of foodstuffs and raw materials to be exchanged for machine-products they came to have a sense of being exploited. In academic theory this was an exchange by which the industrial nation satisfied its food wants and the agricultural nation its industrial wants, to mutual advantage. But how came the industrial nation also to acquire wealth by the transaction? Performing the preferred industrial task, it got not only its food but a profit over. What else could it mean but that after a series of years the industrial nation should come to have large interest-bearing investments in the agricultural country, owning its railroads, tramways, water works, and banks? What else could it mean but that the richest country in foreign investments

## IN PERIL OF TRADE

was the one that had been for the longest time engaged in exchanging the surplus product of its machines for the food and raw materials of other countries? How was it that those other countries, after having served her for many years with food and raw materials, invariably owed her a great deal of money? Or, if you approach it from the other point of view, you find in the economic literature of industrial nations a certain finished doctrine, which is that the exchange of manufactured goods for food and raw materials is a business that pays. It is not primarily a vital transaction. It becomes vital by extension—that is to say, when in the course of time the industrial population has increased beyond the native food supply. But in the beginning the motive is gain. Nakedly, it is an exchange of skilled labour for unskilled labour, to the enrichment of the former; it is a division of labour among nations on a kind of caste plan.

There is much to be said for it. In no other way could civilization have been spread so fast; by no other method could the world have become so rich in a few years. There was much to be said, also,

## IN PERIL OF TRADE

for piracy. It diffused, manners, customs, and wealth; it made peoples acquainted with one another; it made a flat world round and laid the foundations of modern commerce. In the modern case all difficulty begins when the peoples to whom the less profitable tasks have been allotted become intelligently dissatisfied and resolve to change their status, as the American colonists did, as the Japanese did, as now all lusty nations are doing, last of all the Chinese.

Modern trade evolved from piracy. There was a time when all transfer of goods between nations was by joyous might. It is pleasant to believe that the cause of the decline of piracy was a rise in the moral sense of mankind. It is more likely to have been the other way—that as piracy declined for rational reasons rules to govern commercial conduct became necessary. To enforce the rules became everyone's duty. To break them was punishable. From this would germinate a moral sense. Piracy was bound to fail. On a large scale, continuous and competitive, it simply was not feasible. Competition ruined it.

There was a marginal time in which

## IN PERIL OF TRADE

one was either pirate or trader, agreeably to circumstance. The early Greek in his dangerous ship never knew which he was ; nor did anyone else. He took when the taking was good ; when it was not, he bartered. The Romans finally abolished piracy in the Mediterranean, but on the high seas it was the great romantic enterprise down to a very recent time. Some of its heroes are venerated as daring navigators, pathbreakers of empire. It takes some effort to remember that trees are still standing that were already old when the world was a place where finding was keeping. If what you found was in the possession of savages or heathens, you exchanged for it the hope of civilization, maybe a few glass beads. Toward the end, this wonderful business began to be hedged about with restrictions. You had to be careful not to take anything forcibly from people who had treaties of amity with your own country, for if you did they made trouble for you at home, diplomatically, and you might even be hanged at the end of an otherwise glorious voyage.

But if you swindled them in trade, that was all right. Naturally, the first theory

## IN PERIL OF TRADE

of trade was to give the least and get the most. There was else no point to it.

The significance of trade has fundamentally changed in our time. What was a private adventure has become a national necessity, vital to the existing form of the principal industrial states of the world. And yet that first rude theory of it, representing the step from piracy to commerce, universally survives. This, at last, is the crucial fact.

It has been impossible to part with the notion that there must be gain in trade—a profit on one side beyond the mutual satisfaction of unlike wants with unlike goods. Hence the term, balance of trade, meaning the balance in your favour, or against you, from the transactions of commerce. The rule is that the industrial nations come out each year with a balance in their favour. The countries with whom they have been exchanging machine-made goods for food and raw materials owe them money. This simply means that the industrial nations charge more for what they sell than they pay for what they buy. Hence the gain. That is how they get rich. It is more than a rule: it is the very principle of trade; and if you say there is any other principle

## IN PERIL OF TRADE

the commercial mind becomes instantly stark. What would activate trade if not the hope of gain?

Nevertheless, trade on that principle is bound to fail, as piracy failed, and for the same practical reason. On a vast scale, with unlimited participation, it is not continuously feasible. Every nation cannot have a favourable trade-balance. So long as three or four nations had a monopoly of machines and machine-craft, it could be managed; it could even assume such colossal proportions as to create the illusion of being permanent as the way of the world. That monopoly is broken. The machine is increasingly a common possession. Its power is dispersed, and there is much new and unbidden ecstasy in the exercise of it. And whereas it was that a few nations exploited many, what now opens to view is the prospect of all nations simultaneously engaged in the effort to exploit one another. Every frontier a trade wall. Each nation forbidding others to do unto it that which it is bent upon doing to them. So we return to the middle of the sixteenth century, no wiser than the British were when the Parliament voted *An Act Avoiding Divers Foreign Wares*

## IN PERIL OF TRADE

*Made by Handicraftsmen Beyond the Seas* (5 Eliz. c. 7, *Statutes of the Realm*, Vol. IV, Part I, pp. 428-429), 1562. It reads :

Whereas heretofore the artificers of this realm of England (as well within the city of London as within other cities, towns, and boroughs of the same real) that is to wit, girdlers, cutlers, saddlers, glovers, point-makers, and such like handicraftsmen, have been in the said faculties greatly wrought, and greatly set on work, as well for the sustentation of themselves, their wives, and families, as for a good education of a great part of the youth of this realm in good art and laudible exercise :

Yet notwithstanding so now it is, that by reason of the abundance of foreign wares brought into this realm from the parts of beyond the seas, the said artificers are not only less occupied, and thereby utterly impoverished, the youth not trained in the said sciences and exercises, and thereby the said faculties and the exquisite knowledges thereof like in short time within this realm to decay ; but also divers cities and towns within this realm of England much thereby impaired, the whole realm greatly endamaged and other countries greatly enriched.

For reformation whereof, be it enacted by

## IN PERIL OF TRADE

our sovereign lady the Queen's Highness, and by the Lords Spiritual and Temporal, and the Commons of this present parliament assembled and by the authority of the same, that no person or persons whatsoever, from or after the feast of the Nativity of St John Baptist now next ensuing, shall bring or cause to be brought into this realm of England from the parts of beyond the seas, any girdles, harness for girdles, rapiers, daggers, knives, hilts, pummels, lockets, chapes, dagger-blades, handles, scabbards, and sheaths for knives, saddles, horse-harness, stirrups, bits, gloves, points, leather laces, or pins, being ready made or wrought in any parts of beyond the seas, to be sold, bartered, or exchanged within this realm of England or Wales; upon pain to forfeit all such wares so to be brought contrary to the true meaning of this act, in whose hands soever they or any of them shall be found, on the very value thereof.

Shall it be either this again, or from a universal war of machine-competition the survival of one titanic industrial nation with a monopoly of foreign trade and the might to force its surplus goods on other people's markets? That nation would fall in time and not altogether from its own

## IN PERIL OF TRADE

weight. It would, of course, abuse its power ; but, moreover, it would be unable to collect its favourable trade-balances from all the rest of the world.

Logical extremes are fictions of thought. It is always another thing that happens. The one impossibility is for trade to wear in its present character. It has come to the end of its theory, witness the dread with which European statesmen, economists, and industrialists regard the payment of German reparations. How shall Germany pay? In goods. There is no other way. She cannot pay in gold. There is not that much gold in the whole world. The Allied creditors actually lend her a little gold in order that she may recover from her amazing act of bankruptcy and get back to the way of producing exportable wealth. But to whom shall she deliver her goods, or sell them? Great Britain does not want them. Her anxiety is how to keep her own factories going. They make the same goods. France does not wish them, nor Belgium, nor Italy, nor the United States, and all for the same reason. They have a potential surplus of industrial commodities from their own machines. Then shall Germany sell her goods in other

## IN PERIL OF TRADE

markets and turn the money proceeds over to Great Britain, France, *et al*? But they themselves need those other markets on which to sell their own industrial products. German competition is not wanted there. Thus an *impasse*.

If, in desperation, the Allied creditors forgave Germany her reparation debt, or so much of it as she should be obliged to pay in competitive goods, that would be still worse. For Germany would then compete in those other markets on her own initiative and keep the profit. And all the time those other markets, in Asia, Africa, South America, tend to become less and less exploitable because they belong to people who have begun to found industries of their own and are in the way to be natively supplied with manufactures.

## VII

### DIM VISTAS NEW

It must occur to you that what the world requires to find is a new conception of commerce among nations—one that shall be free of the predatory impulse, above the exploiting motive, competitive in some nobler sense. It need not be magnanimous or unselfish—not yet ; but only enlightened enough to comprehend the latter meaning of events.

For a superseding principle the perfect pattern is represented in nature, where you see dissimilar organisms existing together in a state of symbiosis, one sustaining the other, vitally interdependent, yet neither exploiting the other.

There is no accrual of advantage to one side, no gain, no favourable balance of trade. One gives exactly as much as it receives and two wants are equally

## DIM VISTAS NEW

satisfied, with nothing to boot either way.

This is very different from parasitism, which is one-sided, for gain only. And there is a very curious suggestion that organisms now existing together in a state of permanent symbiotic union were once parasitic and learned better.

It cannot be supposed that nations will ever deliberately substitute a principle of mutualism for the principle of gain in trade. They could not if they would. Those that have the advantage must fight for it to the end. Commerce itself, if you look to it, is a complex structure of growth for which there is nowhere any original accountability. It cannot change its philosophy, any more than a tree, for it has none. It has instead a vital instinct for opportunity and a flexible way with necessity and circumstance. There is no hope of its being reformed ideally by mass intelligence. The conglomerate mind is irresponsibly, impersonally selfish; it cannot act without experience. There is no experience of peoples sustaining one another on a sympathetic plan, each willing to give as much as it takes, with no balance favourable or unfavourable to be settled in

gold or debt. This has never happened. It is an idea only.

But if now we move our point of view from the centre to the circumference, we shall see already taking place, with the force of natural events, momentous alterations in the scheme of economic life—one of decay and one of revaluation.

We witness almost unawares the ruin of that classic enterprise of empire which is founded upon the theory of a balance of trade and a division of labour whereby the colonies, the dominions, the subject and mandated peoples are hewers, drawers, and food-bringers, serving those who live in cities, practise machine-craft, and think themselves wholly benevolent.

The machine has betrayed it. Nothing more unexpected has occurred since the discovery of a simple chemical reaction that was to destroy the privileged warrior-caste among mankind. When a splendid knight in armour was powerless against the peasant with a musket and a knight with a musket no better than a peasant, the romantic profession of arms was doomed. Gunpowder ended the age of chivalry. Ultimate military power passed to the people.

## DIM VISTAS NEW

And now for hundreds of millions of people hitherto inferior in status the machine is a symbol of liberation, freedom, independence, recognition, racial power. Japan is the thrilling example in Asia. Did it not deliver her from a thralldom imposed by the Western Powers in the interest of their own trade? Did it not make her in one generation their equal, a nation to be feared? Certainly for these reasons use and possession of the machine will increase in the world beyond any natural economic ratio, and both the power and profit of empire will cease.

The other alteration, already beginning to be visible though not yet adequately understood, is a change in the value of food. Three causes henceforth will be operating together to make food dear. First, as cities continue to grow and the industrial population of the earth continues to augment faster than the agricultural population, the need to import food will be always greater; second, the exportable surplus of food will be always less because as the agricultural and low-craft nations progress toward their ideal of industrial independence they will consume more and more of their own food products; and

## DIM VISTAS NEW

third, the supply of those industrial commodities that are exchanged for food will enormously increase.

In the language of the economist, the agricultural index will rise and the industrial index will fall. It will require a greater quantity of manufactures to buy a bushel of wheat ; fewer bushels of wheat to buy a manufactured article. This will not be for one year or two. It will be lasting. It will affect the status of great groups and classes of people. In the cities and industrial centres the cost of living will move in a vertical manner.

The difficulties of food-importing countries may, almost certainly will, become desperate. The people of Great Britain, for example, will pay dearly for the wealth they have amassed by industry in the last seventy-five years. If the value of food, priced in British machine-wares, should double, then for the same quantity of food as before they would have to give twice the quantity of manufactured goods, which would mean twice as much labour and no more to eat. The same difficulties will beset all countries not self-contained in food. They will exhort their people to return to the fields, which the people will

## DIM VISTAS NEW

be loth to do, having tasted cities. They will expect their governments to make food cheaper by edict, or to buy it out of taxation and distribute it gratis. Moreover, in some countries, taking again the case of Great Britain as notable, there may not be enough land. The people perhaps could not feed themselves no matter how intensively they worked their fields, industry having multiplied the population beyond the utmost potentiality of a native food supply. Obviously indicated is a movement of dispersal together with a limitation upon the increase of industrial population. More power will pass to countries, like the United States, Canada, Brazil, and Australia, that have the advantage of enormous food-reserves. Their problems will be internal.

None of this can happen without much blind and violent resistance. But, of course, it will not happen all at once, not all in one place, nor in every case with a clear meaning. And it is not certain that any amount of experience, however painful, will bring nations to adopt what we have called a symbiotic principle of commerce with one another. There is at first the danger that agriculture in its turn will

## DIM VISTAS NEW

exploit industry as industry has exploited peasantry and that those who possess or control resources of food and raw materials will hold them too dear, thereby taking the industrial nations into their debt or provoking them to insane measures.

Thus the opportunity to go forward might be lost in passion. The fate of retrogression is possible. This has happened many times. It is much less probable than ever before, however, for many reasons that seem permanent. When knowledge was a precious torch borne aloft by a few hands through storm and stress, it was easily quenched. Then darkness. You can hardly imagine destruction of the existing body of science, technology, and fact-knowledge. The mass of it is too great to be lost.

That, of course, has nothing to do with wisdom. By knowledge alone man might extinguish himself utterly. But to suppose that he will not find a new way to go on with, that he will either move the old struggle to new ground or return to medievalism, is to believe there is no law of human progress.

The probability is that he will find the way unknowingly, by groping, and will

## DIM VISTAS NEW

be well upon it before he has had time to formulate any clear idea or theory of what he is doing. He will have found little by little that it pays, better than any other way, not as he once understood profit, but in terms of enduring satisfactions, which may include peace. Critical understanding of it will come later with reflection, and as it comes he will rid his mind of the phantasy in pursuit of which he has made the world so much richer in things than in happiness.

Seeing now only how relentlessly the curse pursued him still and how the affliction of monotonous toil if it be lifted in one place is made heavier in another, he is torn with a sense of frustration. But the view is wrong—false to his first nature. He forgets the truth of his own myth. Somewhere down the ages it got turned upside down. Once he dwelt in the Garden of Eden, or supposed he did, and cared not for it. He was bored there and beguiled to his fall. The figure at the gate forbidding his return is a symbol of self-knowledge; it was set there by his own forethought, lest he should be tempted to go back.

If the machine with which he has

## DIM VISTAS NEW

believed himself to be storming a childish wish ever brought him to a state of effortless ease on earth, that would be his last.

It may be a power he is yet morally unprepared to exercise. How strange at least that with an incentive so trivial and naïve in itself he should have been able to perform an absolute feat of creation !

The machine was not. He reached his mind into emptiness and seized it. Even yet he cannot realize what he has done. Out of the free elemental stuff of the universe, visible and invisible, some of it imponderable, such as lightning, he has invented a class of typhonic, mindless organisms, exempt from the will of nature.

We have no understanding of creation, its process or meaning. The machine is the externalized image of man's thoughts. It is furthermore an extension of his life, for we perceive as an economic fact that human existence in its present phase, on its present scale, could not continue in its absence. And what are we ourselves, life to begin with, if not an image of thought ? Perhaps it is true as a principle of creation that the image and its creator must co-exist, inseparably.

## DIM VISTAS NEW

In any light, man's further task is Jovian. That is to learn how best to live with these powerful creatures of his mind, how to give their fecundity a law and their functions a rhythm, how not to employ them in error against himself—since he cannot live without them.



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